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IS 12825 (1989): Piezoelectric ceramic elements for electronic buzzers [LITD 5: Semiconductor and Other Electronic Components and Devices]

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Indian Standard

PIEZOELECTRIC CERAMIC ELEMENTS FOR ELECTRONIC BUZZERS — SPECIFICATION

भारतीय मानक

इलैक्ट्रॉनी बजरों के लिए दाबवैद्युत मृत्तिका एलीमेंट — विशिष्टि

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

April 1990

Price Group 1

Piezoelectric Devices for Frequency Control and Selection Sectional Committee, LTDC 12

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards on 15 December 1989, after the draft finalized by the Piezoelectric Devices for Frequency Control and Selection Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

This standard is intended to cover the requirements and the methods of tests of piezoelectric ceramic elements for electronic buzzers.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

PIEZOELECTRIC CERAMIC ELEMENTS FOR ELECTRONIC BUZZERS — SPECIFICATION

1 SCOPE

1.1 This standard deals with the requirements and methods of tests for piezoelectric ceramic elements for electronic buzzers.

2 REFERENCES

2.1 The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
1885 (Part 44) : 1978	Electrotechnical vocabulary: Part 44 Piezoelectric devices
11014 (Part 1) : 1984	Specification for piezoelectric ceramic materials: Part 1 General aspects and methods of measurements
11014 (Part 2) : 1984	Specification for piezoelectric ceramic materials: Part 2 Types 1 and 5

3 TERMINOLOGY

3.1 For the purpose of this standard, the terms and definitions given in IS 1885 (Part 44) : 1978 and IS 11014 (Part 1) : 1984 shall apply.

4 PIEZOELECTRIC CERAMIC MATERIAL

4.1 The material of piezoelectric ceramic element for electronic buzzer shall be in accordance with Type 5 of IS 11014 (Part 2) : 1984.

5 CONSTRUCTION

5.1 The piezoelectric ceramic element for electronic buzzer (*see* Fig. 1) shall be in the form of rectangular plate or disc bound on to a support metallic sheet. The element shall be free from chips, cracks and pin holes. The metallic base shall be flat and free from distortion.

6 OPERATION

6.1 If a voltage applied to the element, the latter changes its diameter causing a deformation like a bimetal, depending upon the polarity of the applied voltage (*see* Fig. 2). As the ac voltage excites of the element at its natural responance frequency, a large bending amplitude is obtained and thus a high sound output.

7 DIMENSIONS AND CHARACTERISTICS OF THE ELEMENT

7.1 The dimensions and the characteristics of the element shall be declared by the manufacturer. The typical values are given in Table 1.

8 ELECTRICAL TESTS

8.1 Capacitance

The capacitance shall be measured at 1 kHz.

8.2 Resonant Frequency

The resonance frequency shall be measured at maximum and minimum impedance according to **4.12** of IS 11014 (Part 1) : 1984.

8.3 Variation of Resonance Frequency Over the Operating Temperature

Variation of resonance frequency over the temperature range − 20°C to + 60°C shall be determined.

The variation shall not be more than 10 percent.

9 MARKING

9.1 Each carton containing these elements shall have the following information clearly and indelibly marked on it:

a) Manufacturer's name or trade-mark,

b) Size of the element, and

c) Country of manufacture.

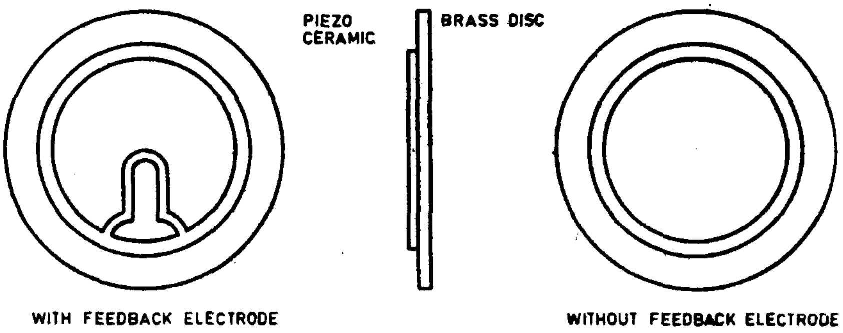

Fig. 1 Piezoelectric Ceramic Element for Electronic Buzzers

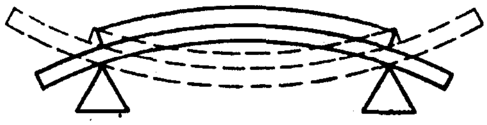

Fig. 2 Piezoelectric Ceramic Element for Electronic Buzzer Under Applied Voltage

Table 1 Dimensions and Characteristics of Element for Electronic Buzzers

(*Clause* 7.1)

Sl No.	Characteristics	Unit	Requirements			
i)	Piezo-ceramic element (outer diameter)	(mm)	14	20	25	32
ii)	Metal disc (outer diameter)	(mm)	20	27	35	50
iii)	Piezo-ceramic element (thickness)	(mm)	0·2	0·2	0·25	0·17
iv)	Metal disc (thickness)	(mm)	0·2	0·3	0·3	0·3
v)	Total thickness	(mm)	0·43	0·53	0·58	0·5
vi)	Resonance frequency	(kHz)	6·3 ± 1	4·6 ± 0·5	2·8 ± 0·5	2·5 ± 0·5
vii)	Resonance impedance	(ohm)	350	250	200	200
viii)	Capacitance	(nF)	12 ± 30 percent	24 ± 30 percent	38 ± 30 percent	75 ± 30 percent
ix)	Operating temperature	(°C)	−20 to +60	−20 to +60	−20 to +60	−20 to +60

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